

M/047/0090

cc: Leslie  
Tom

**From:** "Barclay Cuthbert" <barclay.cuthbert@earthenergyresources.com>  
**To:** <rherbert@utah.gov>, <mnovak@utah.gov>  
**Date:** 2/8/2011 2:14 PM  
**Subject:** Earth Energy Resources - Ground Water Discharge Permit-by-Rule  
**Attachments:** 110208herbert.pdf; DWQ letter March 4 2008.pdf; Florachem MSDS.pdf; Frutech MSDS.pdf; NOI Figure 7 Water Features.pdf

**CC:** "Bob Bayer" <rbayer@jbrenv.com>, <danadean@utah.gov>, "Paul Baker" <... Robert and Mark:

By letter dated March 4, 2008, Earth Energy Resources, Inc.'s ("Earth Energy") PR Spring Tar Sand Project (the "Project") received Ground Water Discharge Permit-By-Rule status from the Utah Department of Environmental Quality, Division of Water Quality ("DWQ"). In the time since this determination was granted, Earth Energy has continued its work on development of the "Ophus Process" and related permitting work with other agencies, principally the Utah Department of Natural Resources, Division of Oil, Gas and Mining. I have prepared a letter that outlines changes to our process and the site configuration over this time period. Please review this letter and attachments and confirm that the original Ground Water Discharge Permit-By-Rule status granted on March 4, 2008 remains valid and in effect.

I will drop an original of this package in the mail to you today. Copies are distributed electronically to those individuals noted on the copy list at the end of the letter.

If you require any further information, please contact me at your convenience.

Best regards,

Earth Energy Resources Inc.

Barclay Cuthbert

Vice President, Operations

Tel: + 1.403.233.9366

Cell: + 1.403.619.4230

Fax: + 1.403.290.0045

E-mail: barclay.cuthbert@earthenergyresources.com



Suite 950, 633 - 6th Avenue SW

Calgary, AB T2P 2Y5

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February 08, 2011

Mr. Rob Herbert,  
Utah Division of Water Quality  
288 North 1460 West  
P.O. Box 144870  
Salt Lake City, Utah 84114-4870

Subject: PR Spring Tar Sands Project, Uintah and Grand Counties, Utah  
Ground Water Discharge Permit-by-Rule

Dear Mr. Herbert:

I write to identify some changes in our PR Spring Tar Sands Project ("Project"), which have been made since the March 4, 2008 letter informing Earth Energy Resources, Inc. ("Earth Energy") of the Project's Ground Water Discharge Permit-By-Rule status from the Utah Department of Environmental Quality, Division of Water Quality ("DWQ"). The letter, a copy of which is attached, enumerated four factors used in determining that the Project "will have a *de minimis* effect on ground water quality or beneficial uses of ground water resources."

First, based on Material Safety Data Sheets, (which are attached), the reagent used in the extraction process is non-toxic, volatile, and most of it will be recovered and recycled in the extraction process.

Second, extraction will occur using tanks and equipment at a processing facility at the mine site, no impoundments or process water ponds are planned, and most of the water used in the process will be recovered and recycled.

Third, the process tailings will not be free draining, with moisture content in the 10-20% range, and "will not contain any added constituents that are not present naturally in the rock, other than trace amounts of the reagent used for bitumen extraction."

Fourth, the letter addressed the hydrologic setting of the Project.

The letter also states that "[i]f any of these factors change because of changes in your operation or from additional knowledge of site conditions, this permit-by-rule determination may not apply and you should inform DWQ of the changes."

Since the PR Spring Mine, Request for Permit-by-Rule Determination ("Request") was submitted on February 21, 2008 by JBR Environmental Consultants, Inc. on behalf of Earth

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Energy, Earth Energy has continued to refine the process for extracting bitumen from tar sand to improve recovery and reduce the potential for impacts to the environment.

First, we have removed the stabilizer component from the cleaning emulsion used for bitumen extraction. Page 5 of the Request provides details of the mixing of the cleaning emulsion and the tar sands. In our development of this "Ophus Process," we have determined that the emulsion can be formed concurrently with introduction to the tar sands, so pre-mixing and stabilization of the emulsion is no longer required. The stabilizer, known as Witconate, is an alkyl aryl sulphonate and is oil soluble, so when the cleaning emulsion was mixed with tar sand, the stabilizer dissolved into the oil phase and was not present in the tailings. The use of a stabilizer was not among the factors that DWQ used in determining that the Project will have a *de minimis* effect on ground water quality, and its omission from the cleaning emulsion removes a chemical from the process stream.

Second, we have identified de-watering equipment that we plan to use on the Project. Page 6 of the Request includes details of methods to de-water sand and fines remaining after bitumen is removed from the tar sands, and we identified a "shale shaker (or similar device)." With a global supplier of mine processing equipment, we have identified equipment that will economically recover water from the sand and fines. For the sand, we now expect to use a horizontal belt filter, and for the fines we expect to use a disk filter. With these components, the aggregate water content of the blended tails should be less than 15% by weight – maximizing our recovery of available water while providing a material at near optimum moisture content for compaction. The shale shaker that we initially contemplated using was not among the four factors that DWQ used to determine that the Project will have a *de minimis* effect on ground water quality.

Third, working with the Utah Department of Natural Resources Division of Oil, Gas and Mining ("DOGM"), we have finalized the size of the overburden/interburden storage areas and provided more detail on the sequencing of mining and backfilling. Page 5 of the Request stated that the overburden/interburden storage areas would be approximately 25 acres each. Our final approved site design includes two overburden/interburden storage areas of 36 and 34 acres. The sizes of these storage areas were not among the four factors, on which DWQ relied in determining that the Project will have a *de minimis* effect on ground water quality.

Fourth, working with DOGM, we have determined it is necessary to dispose of some processed sands and fines in the overburden/interburden storage areas. On page 6 of the Request, we stated that the processed sands and fines remaining after bitumen extraction would be used to backfill the open pit. During initial operations, the pit opening will not be sufficiently large to accept processed sands and fines, so some of these tailings will be placed in the overburden/interburden storage areas. Earth Energy has worked closely with JBR Environmental Consultants and DOGM to ensure that the final design will isolate and

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encapsulate the tailings within the coarser overburden and interburden, so that they will not migrate and will not impact surface or ground water below the storage areas. The disposal of these tailings was not among the four factors that DWQ used to determine that the Project will have a *de minimis* impact on ground water quality.

None of these process improvements affect the factors used in determining the Projects permit-by-rule status, and, for that reason, had not been reported to DWQ. However, in a challenge to the DOGM's approval of Earth Energy's Notice of Intent to Commence Large Mining Operations ("NOI"), by Living Rivers and its counsel, Western Resources Advocates, these improvements have been raised in an attempt to show that DOGM should not have relied on DWQ's determination in approving the NOI.

Living Rivers and its counsel also focus on the portion of the Request which states: "There are no springs in the Earth Energy leased area." Our understanding of this statement was that there are no springs within the approximately 200-acre Project area, which is accurate. Earth Energy's lease encompasses a much broader area: 5,930 acres, and there are two USGS mapped springs in that much larger area, as described on page 2 of the Request. A map submitted and approved by DOGM, which shows water features in the vicinity, is attached.

Please review this information in conjunction with the original Request and confirm that the Ground Water Discharge Permit-By-Rule status granted on March 4, 2008 remains valid and in effect. If you have any questions or require further information, please contact either the undersigned or Mr. Robert Bayer of JBR Environmental Consultants, Inc. (801.943.4144).

Yours truly,  
Earth Energy Resources, Inc.

Barclay Cuthbert  
Vice President

Enclosure(s)

cc: Robert J. Bayer, JBR Environmental Consultants, Inc.  
Dana Dean, Utah Division of Oil, Gas and Mining  
Paul Baker, Utah Division of Oil, Gas and Mining  
A. John Davis, Holme Roberts & Owen LLP

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## State of Utah

Department of  
Environmental QualityRichard W. Sprott  
Executive DirectorDIVISION OF WATER QUALITY  
Walter L. Baker, P.E.  
DirectorJON M. HUNTSMAN, JR.  
GovernorGARY HERBERT  
Lieutenant Governor

March 4, 2008

Mr. Barclay Cuthbert  
Earth Energy Resources, Inc.  
Suite 740, 404 - 6<sup>th</sup> Avenue SW  
Calgary, Alberta, Canada T2P 0R9Subject: PR Spring Tar Sands Project, Uintah and Grand Counties, Utah  
Ground Water Discharge Permit-By-Rule

Dear Mr. Cuthbert:

The Division of Water Quality (DWQ) has reviewed the information submitted by JBR Environmental Consultants, Inc. on February 22, 2008 requesting ground water discharge permit-by-rule for the proposed Earth Energy Resources, Inc. PR Spring tar sands project. The proposed operation consists of open-pit mining of tar sands, extraction of bitumen, and disposal of tailings and waste rock.

Below are several relevant factors for determining whether the proposed operation will have a *de minimis* effect on ground water quality or beneficial uses of ground water resources.

1. Based on Material Safety Data Sheets and other information that you sent to DWQ in January 2007, the reagent to be used for bitumen extraction is generally non-toxic and volatile, and most of it will be recovered and recycled in the extraction process. (Because the extraction process is proprietary at this time, this reagent will not be identified in public documents.)
2. Bitumen extraction will be done using tanks and equipment at the processing facility located at the mine site, and no impoundments or process water ponds are planned. Most of the water used in the process will be recovered and recycled.
3. Processed tailings will not be free-draining and will have moisture content in the 10 to 20 percent range. The tailings will not contain any added constituents that are not present naturally in the rock, other than trace amounts of the reagent used for bitumen extraction. Analysis of processed tailings using the Synthetic Precipitation Leachate Procedure indicates that leachate derived from the tailings by natural precipitation would have non-detectable levels of volatile and semi-volatile organic compounds. Unprocessed tar sands and processed tailings were analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) with an extraction process that uses a much lower pH than is likely to occur at the mine site. Analytical results indicate that TCLP metals would not be leached from the tailings at detectable levels except for barium, which was detected at levels below the Utah ground water quality standard of 2.0 milligrams per liter (Table 1 of UAC 317-6). Based on these data, the tailings will be disposed by backfilling into the mine pit.



Mr. Barclay Cuthbert  
March 4, 2008  
Page 2

4. The uppermost geologic formations at the site are the Parachute Creek and Douglas Creek Members of the Green River Formation, which consist of fluvial-deltaic and lacustrine-deltaic deposits of claystone, siltstone, fine-grained sandstone, and limestone. The Parachute Creek Member outcrops over most of the Earth Energy lease and is the 0 to 50-foot thick overburden above the tar sand deposits of the Douglas Creek Member. Shallow ground water at the site is not part of a regional aquifer but occurs in localized laterally discontinuous perched sandstone lenses of the Douglas Creek Member. Exploration drilling did not encounter ground water within 150 feet of the land surface. Based on records from the Division of Oil, Gas, and Mining, the closest major aquifer is the Mesa Verde Formation, which occurs approximately 2000 feet below ground surface in the area of the proposed mine. The topography of the project area is characterized by mesas incised by deep, narrow canyons, and limited shallow ground water discharges as springs in the canyon bottoms. There are no springs in the Earth Energy leased area and the nearest spring is PR Spring located slightly less than a mile east of the project site.

Considering the factors described above, the proposed mining and bitumen extraction operation should have a *de minimis* potential effect on ground water quality and qualifies for permit-by-rule status under UAC R317-6-6.2.A(25). If any of these factors change because of changes in your operation or from additional knowledge of site conditions, this permit-by-rule determination may not apply and you should inform the DWQ of the changes. If future project knowledge or experience indicates that ground water quality is threatened by this operation, the Executive Secretary may require that you apply for a ground water discharge permit in accordance with UAC R317-6-6.2.C.

This operation may require a storm water permit under the Utah Pollutant Discharge Elimination System (UPDES). Please contact Mike George of this office at (801) 538-9325 to determine if a storm water permit is required.

Disposal of domestic wastewater from the operation should be done in a manner approved by the appropriate local health department; Tri-County Health Department for Uintah County or Southeastern Utah Health Department for Grand County.

If you have any questions about this letter, please contact Mark Novak at (801) 538-6518.

Sincerely,



Rob Herbert, P.G., Manager  
Ground Water Protection Section

cc: Robert Bayer, JBR  
Paul Baker, DOGM  
Carl Adams, DWQ-TMDL  
Mike George, DWQ-UPDES Storm Water  
Dave Ariotti, Southeastern Utah District Engineer  
Scott Hacking, Tri-County District Engineer  
Southeastern Utah Health Department  
Tri-County Health Department

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Florachem Corporation  
PO Box 5366  
Jacksonville, FL 32247  
Phone: 904-733-5759  
Fax: 904-733-5950

## Material Safety Data Sheet

### ----- Section 1 • Chemical Product and Company Identification -----

Product Name: **d-Limonene**

**Company:**  
Florachem Corporation  
5209 San Jose Blvd., Suite 202  
Jacksonville, FL 32207 USA  
Phone 904-733-5759

**Emergency Telephone Numbers:**  
24 hrs Chem-Tel 800-255-3924 [within continental US]  
24 hrs 813-248-0585 (collect) [outside continental US]

Revised August 2001

### ----- Section 2 • Composition, Information on Ingredients -----

Component	CAS No.	OSHA HCS Hazard(s)
d-Limonene	5989-27-5	Flammable Liquid. Skin and eye irritant.

**EC Classifications:**

XI	Irritant
R36	Irritating to eyes.
R38	Irritating to skin.
S24	Avoid contact with skin.
S25	Avoid contact with eyes.

### ----- Section 3 • Hazards Identification -----

**Emergency Overview:**

Appearance:	Colorless to pale yellow liquid
Odor:	Fresh citrus orange
Risk Summary:	Moderate eye and skin irritant. This substance is flammable and will sustain combustion at temperatures above its flashpoint. Avoid heat, sparks and open flame.

**Potential Health Effects:**

Inhalation:	Vapors may cause respiratory passage irritation in confined spaces. No known long-term hazards.
Eyes:	Irritating to eyes.
Skin:	Irritating to skin.
Ingestion:	Will be irritating to tissues. May be harmful or fatal if swallowed in sufficient quantity. See Section 11 (Toxicological information) for further information.
Chronic:	Not considered a carcinogen by NTP, IARC, or OSHA. No known chronic indications.

**Environmental Hazards:**

Marine Pollutant

d-Limonene MSDS • Florachem Corporation • Page 1 of 3



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## ----- Section 4 • First Aid Measures -----

Inhalation: Remove person to a ventilated area. See a physician if breathing difficulty persists.  
Eyes: Remove contact lenses. Flush with water for at least 15 minutes. See a physician if irritation persists.  
Skin: Remove contaminated clothing. Wash affected areas with soap and water. See a physician if irritation persists.  
Ingestion: Drink lots of water to dilute substance. See a physician.

## ----- Section 5 • Fire Fighting Measures -----

Flammable Properties: Flashpoint 46°C (115°F) TCC. Vapors can combust and liquids can burn when temperatures reach or exceed the flashpoint.  
Extinguishing Media: Carbon dioxide, dry chemical, foam.  
Fire Fighting Instructions: Use CO2, foam or dry chemical. Use water as a spray only to lower temperature. This substance floats on water. Treat as an oil fire.

## ----- Section 6 • Accidental Release Measures -----

Personal Precautions: See Section 8, Personal Protection.  
Environmental Precautions: Do not discharge into surface waters. May be toxic to aquatic organisms. See Section 3 (Environmental Hazards) and Section 12 (Ecological Information) for further information.  
Containment and Cleanup Techniques: Exercise caution as hard floors coated with this material may be slippery. Small spills may be absorbed by sand or oil-absorbing materials. Large spills should be collected by pumping into closed containers for recovery or disposal. Spills over water will float and may be collected by oil absorbents or by skimming.

## ----- Section 7 • Handling and Storage -----

Handling: Wear chemical safety glasses or goggles and chemically resistant gloves. A chemically resistant apron may be used to protect clothing. A respirator may be worn to prevent breathing spray mists or heated fumes.  
Storage: Store in tightly closed metal or glass containers. Containers should be full or blanketed by inert gas. Do not store in plastic. Avoid heat, sparks, and open flames.

## ----- Section 8 • Exposure Controls, Personal Protection -----

Ventilation: Mechanical ventilation may be necessary at elevated temperatures to control odor.  
Respiratory Protection: Organic vapor cartridge may be used to prevent irritation from mists and vapors and for odor elimination.  
Skin Protection: Wear chemically resistant rubber gloves and apron (viton, nitrile, and or PVC) to minimize exposure.  
Eye Protection: Wear chemical safety glasses, goggles, or face shield to prevent eye contact.

## ----- Section 9 • Physical and Chemical Properties -----

Appearance: Colorless to pale yellow liquid.  
Boiling Point: 154°C (310°F).  
Flashpoint: 46°C (115°F) TCC.  
Odor: Fresh citrus orange  
Oxidizing Properties: This substance combusts in the presence of strong oxidizers.  
pH: None (not water soluble).  
Physical State: Liquid.  
Solubility in water: less than 0.1%.  
Specific Gravity: 0.84 @ 25°C.  
Vapor Pressure: 2 mmHg at 20°C.  
Vapor Density: >1 (air = 1.0).



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## ----- Section 10 • Stability and Reactivity -----

Conditions to Avoid: Excessive temperatures and/or contact with air may cause decomposition or oxidation.

Materials to Avoid: Avoid contact with strong acids, strong bases, and oxidizing agents. Reacts explosively with iodine pentafluoroethylene.

Decomposition Products: Incomplete decomposition product may include CO. Ultimate decomposition products are CO<sub>2</sub> and water.

## ----- Section 11 • Toxicological Information -----

Target Organs: Eyes and skin.

Routes of Entry: Eye and skin contact.

Acute Toxicity: LPR-Mus TD<sub>Lo</sub>: 4800mg/kg/8W-I:ETA.  
ORL-Mus TD<sub>Lo</sub>: 67g/kg/39W-I:ETA.

Chronic Toxicity: No known chronic indications.

## ----- Section 12 • Ecological Information -----

Biodegradability: Not determined. Related chemicals are known to be biodegradable.

Aquatic Toxicity: Marine Pollutant. This substance is immiscible with water. This substance is known to evaporate quickly and biodegrade and should not cause long-term effects.

Bioaccumulation Potential: Not Determined. Related chemicals are known to be non-accumulating in the environment.

## ----- Section 13 • Disposal Considerations -----

RCRA Hazardous Waste: Classified as a RCRA Hazardous waste (flammability characteristic).

Disposal Methods: Dispose of this material by incineration or recovery at a government-approved disposal facility.

## ----- Section 14 • Transport Information -----

DOT:

Proper Shipping Name: Terpene hydrocarbons, n.o.s., 3, UN2319, PG III

Exceptions: Chemicals, n.o.i. (Not Regulated) - allowable for shipment in non-bulk containers.

IMO: DIPENTENE., 3, UN2052, PGIII, MARINE POLLUTANT.

IATA: Terpene hydrocarbons, n.o.s., 3, UN2319, PGIII.

## ----- Section 15 • Regulatory Information -----

OSHA - Hazardous by definition of 29CFR1910.1200 for flammability.

CERCLA - (SARA Title III) Hazard Category - Fire hazard.

## ----- Section 16 • Other Information -----

Hazard Ratings (0 = minimal, 1 = slight, 2 = moderate, 3 = serious, 4 = severe)

HMIS: Health = 2 Flammability = 2 Reactivity = 1 Personal Protection = C

NFPA: Health = 1 Flammability = 2 Reactivity = 0

The information contained in this document is believed to be current and accurate. It is given in good faith and without warranty, expressed or implied, as to its accuracy. Anyone using this product is solely responsible for determining its suitability in any given application.





P.O. Box 2219  
Covina, CA. 91722-8219  
Phone (818) 966-8361 Fax (818) 332-7921

### MATERIAL SAFETY DATA SHEET

Emergency Response 800 424 9300

#### I.- PRODUCT IDENTIFICATION

Manufacturer :	Frutech International Corporation 3/8-Mile East Expressway 83 Mission, TX. 78572
Trade Name :	Orange Terpenes
Formula :	N/A
Chemical and Common Name :	Orange Terpenes.
CAS Number :	8026-48-6

#### II.- TYPICAL PHYSICAL AND CHEMICAL CHARACTERISTICS

Appearance and Odor :	Colorless liquid with mildly Citrus odor.
Boiling Point ( @ 760 mm Hg) :	176.7C (350°F)
Vapor Pressure (Torr @ 25°C) :	Not Available
Vapor Density (Air = 1) :	0.0123 @ 20°C (68°F)
Specific Gravity :	0.840
Solubility in Water :	Negligible

#### III.- FIRE, EXPLOSION AND REACTIVITY HAZARD DATA

Flash Point (Tag closed up) :	46°C (115°F) Class III Flammable liquid
Ignition Temperature :	237°C (458°F)
Flammable Limits (% by volume) :	Lower : 0.7 Upper : 6.1
Fire Extinguishing Media :	Use media for Class B fires : foam CO2 or dry compound Avoid direct contact with water.
Special fire fighting procedures :	If confined in a container, cool de exterior with water spray.
Unusual fire and explosion hazards :	Dense black smoke produced.
Hazardous products of combustion :	None. NFPA health hazard rating = 0
Stability considerations :	Stable.
Incompatibility with :	Oxidizing agent, acids, peroxides, halogens, vinyl chloride, iodine pentafluoride.
Hazardous polymerization :	Avoid high temperature, contact with reactive monomers (i.e. methacrylates or vinyl chloride)
Hazardous decomposition products:	None
Conditions to avoid :	In typical flavoring uses, no contact with inflammable or explosive chemicals likely.

#### IV.- HEALTH HAZARD DATA

OSHA permissible exposure limit :	Not listed.
ACGIH threshold limit value :	Not listed.



**Frutech**  
International CorporationP.O. Box 2219  
Covina, CA. 91722-8219

Phone (818) 966-8361

Fax (818) 332-7921

**IV.- HEALTH HAZARD DATA**

Carcinogenicity : Not listed in NTP, IARC, or OSHA directories of carcinogenic materials.

Effects of overexposure :

Acute : Vapor irritates eyes and mucous membranes. Skin contact with liquid may cause localized itching.

Chronic : Frequent exposure may induce dermatitis in sensitive individuals. Prolonged contact has caused photosensitivity in some cases.

Primary route of Exposure : Skin contact

Emergency first aids procedures :

Eyes : Flush with water for at least 15 minutes. If irritation

Skin : Wash with soap and water. If persists, see a physician.

Ingestion : See a physician.

Medical conditions generally recognized

As being aggravated by exposure : None known.

**V.- SPILL OR LEAK PROCEDURES**

Steps to be taken in case material is released or spilled :

Shut off source, if possible to do so without hazard. Keep open flames and spark sources away. Do not allow liquid to enter municipal sewage system.

Water disposal method :

Contain and absorb spilled liquid with sand or earth. Remove spend absorbent and dispose in accordance to State, federal and Local disposal laws.

**VI.- PERSONAL PROTECTION, HANDLING AND STORAGE INFORMATION**

Personal Protective Equipment : Protective gloves. Safety glasses.

Appropriate Hygienic Practice : Wash thoroughly after handling.

Ventilation : Mechanical ventilation recommended.

Restrictions : No open flames, smoking or unshielded lights

Handling and storage precautions : Store in cool, well ventilated place away from reactive chemicals, spark sources, or open flames. Container should be kept closed and plainly labeled.

Date of Issue : March 05, 1997

Prepared By : V. Onchi

For emergency information or further questions, contact Chemtrec @ at 1 (800) 424-9300, for International Emergencies call collect (202) 483-7616. No guarantee is made as to the accuracy of any data or statement contained herein. While this information is furnished in good faith, and is accurate to the best of our knowledge, no warranty, express or implied, of merchantability, fitness, or other use is made. This information is offered only for your consideration, investigation, and verification ; Frutech International Corporation, shall not in any event be liable for special, incidental, or consequential damages in connection with its publication. Likewise, no statement made herein shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents.





## Technical Specification Sheet

## Orange Terpenes

Product description

This product is the solvent and oil phase of the cold pressed orange oil that is produced by fractionated vacuum distillation. Its composition is mainly monoterpenic hydrocarbons.

Chemical and Physical characteristics

Percent of D-Limonene (HP5890 SPB-5)	94.20 - 97.99
Aldehydes (%) w/w - expressed as decanal	0.3 to 0.8
Optical Rotation - 100 mm tube (25°C)	+99.0° to +100.0°
Specific Gravity (25/25°C)	0.840 to 0.841
Refractive Index (20°C)	1.4726 to 1.4740
Evaporation Residue (%) w/w	N.D.

Organoleptic characteristics

Color	Colorless, crystal clear.
Odor	Mildly Citrus odor

Packaging

386 pound fill in a closed, nitrogen sealed, epoxy lined steel drum.

Storage recommendations

- = Orange terpenes deteriorate with exposure to air (oxidation), light, heat and water (humidity). Transfer oil from a larger partially filled container to a smaller, well filled container to reduce headspace to a minimum at all times.
- = This product is best when used within six months from date of purchase, if it is stored at 45°F (7.2°C) to 65°F (18.3°C) in the unopened original container.

Last revision September 5 th, 1997.

The information submitted, to the best of our knowledge, is true and accurate. All recommendations or suggestions pertaining to product use or production procedures are made without warranty or guarantee and users should make their own test to determine the suitability for their own particular purpose. Any prices quoted are subject to change without notice.





**Frutech**  
International Corporation

**QUALITY ASSURANCE CERTIFICATE**

**Orange Terpenes**

**Product description**

This product is the solvent and oil phase of the cold pressed orange oil that is produced by fractionated vacuum distillation. Its composition is mainly monoterpenic hydrocarbons.

**Product Lot :**

09060501

**Bill of Lading:**

1609

**Chemical and Physical characteristics**

	Average	Analysis
Aldehydes (%) w/w - expressed as decanal	0.3 to 0.8	0.45%
Optical Rotation - 100 mm tube (25°C)	+99.0° to +100.1°	100.0°
Specific Gravity (25/25°C)	0.840 to 0.841	0.840
Refractive Index (20°C)	1.4726 to 1.4740	1.4740

**Organoleptic characteristics**

Color	Colorless, crystal clear.
Odor	Mildly Citrus odor

**Chromatographic Analysis**

**Chem Station HP 6890 GC, HP 5MS, 30 M, 0.32 mm, 0.25 um**

**Analysis**

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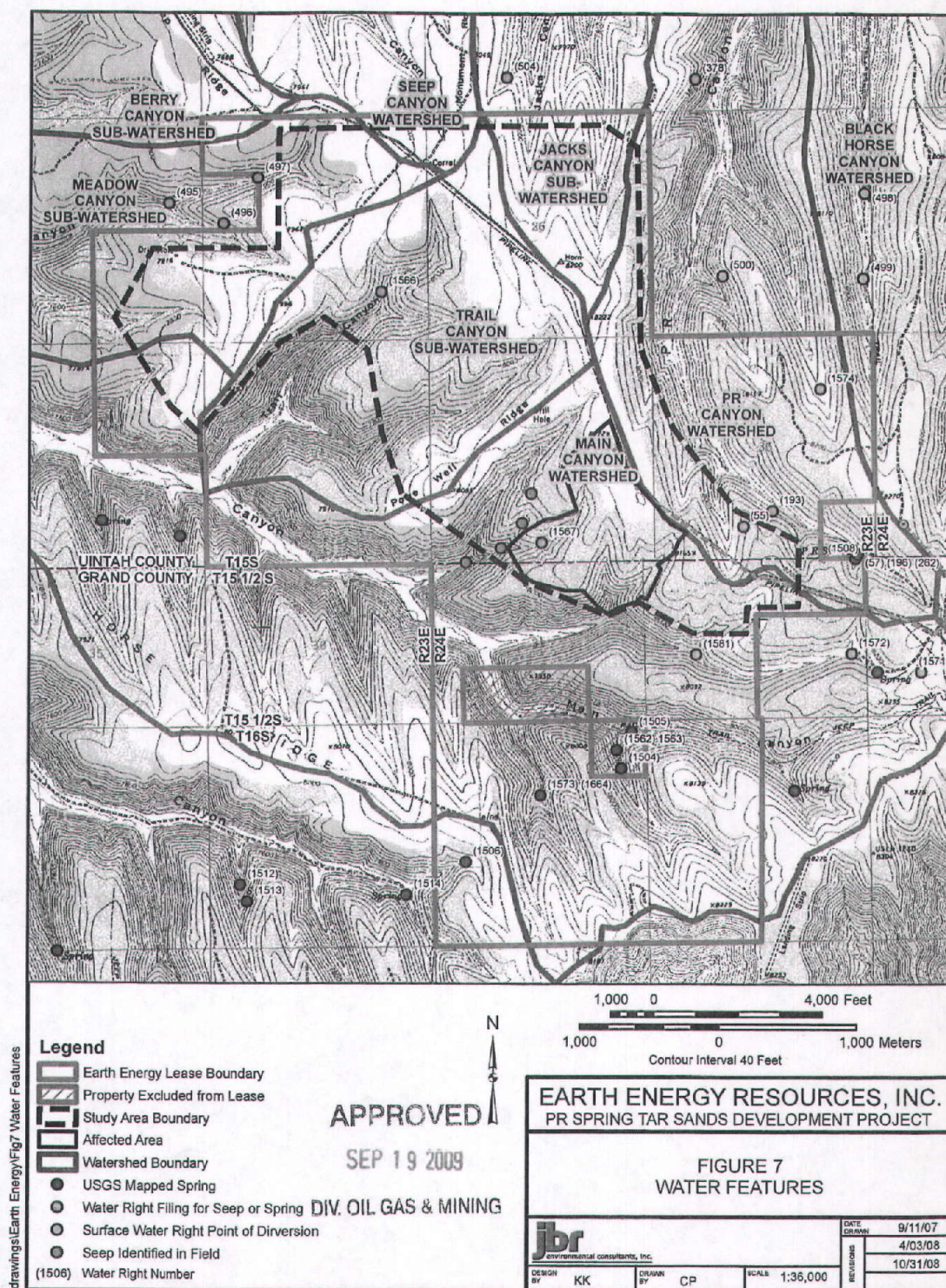
Percent of $\alpha$ -Pinene :	0.569
Percent of Sabinene :	0.277
Percent of $\beta$ -Pinene :	0.020
Percent of Myrcene :	1.984
Percent of Octanal :	0.270
Percent of D-Limonene :	96.332
Percent of Linalool :	0.169
Percent of Decanal :	0.000

**Storage recommendations**

- = Orange terpenes deteriorate with exposure to air (oxidation), light, heat and water (humidity). Transfer oil from a larger partially filled container to a smaller, well filled container to reduce headspace to a minimum at all times.
- = This product is best when used within six months from date of purchase, if it is stored at 45°F (7.2°C) to 65°F (18.3°C) in the unopened original container.

The information submitted, to the best of our knowledge, is true and accurate. All recommendations or suggestions pertaining to product use or production procedures are made without warranty or guarantee and users should make their own test to determine the suitability for their own particular purpose. Any prices quoted are subject to change without notice.







**From:** "Barclay Cuthbert" <barclay.cuthbert@earthenergyresources.com>  
**To:** "Paul Baker" <paulbaker@utah.gov>  
**Date:** 2/8/2011 3:06 PM  
**Subject:** RE: Earth Energy Resources - Ground Water Discharge Permit-by-Rule

**CC:** "John Davis" <john.davis@hro.com>, "Christopher R. Hogle" <Chris.Hogle@h...  
Hi Paul,

All information in my e-mail is considered non-confidential. The figure from the NOI and correspondence with DWQ were included in the information publicly available at DOGM. The MSDSs are also available on the internet and been disclosed to various parties as a result of the proceeding.

Thanks for confirming the confidentiality provisions.

Regards,

Barclay

Best regards,  
Earth Energy Resources Inc.

Barclay Cuthbert  
Vice President, Operations  
Tel: + 1.403.233.9366  
Cell: + 1.403.619.4230  
Fax: + 1.403.290.0045  
E-mail: barclay.cuthbert@earthenergyresources.com

Suite 950, 633 - 6th Avenue SW  
Calgary, AB T2P 2Y5

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-----Original Message-----

From: Paul Baker [mailto:paulbaker@utah.gov]  
Sent: February 08, 2011 2:54 PM  
To: Barclay Cuthbert  
Subject: Re: Earth Energy Resources - Ground Water Discharge Permit-by-Rule

Thank you, Barclay. One question: Your e mail has the caveat statement that it may contain confidential information. While the attachments have information that might be considered confidential, it seems like you've been willing to disclose just about everything. How would you like me to handle this? It could legitimately go either way.

Paul Baker  
Minerals Program Manager



Utah Division of Oil, Gas and Mining  
801-538-5261  
Fax 801-359-3940

>>> "Barclay Cuthbert" <barclay.cuthbert@earthenergyresources.com>  
>>> 2/8/2011 2:12 PM >>>  
Robert and Mark:

By letter dated March 4, 2008, Earth Energy Resources, Inc.'s ("Earth Energy") PR Spring Tar Sand Project (the "Project") received Ground Water Discharge Permit-By-Rule status from the Utah Department of Environmental Quality, Division of Water Quality ("DWQ"). In the time since this determination was granted, Earth Energy has continued its work on development of the "Ophus Process" and related permitting work with other agencies, principally the Utah Department of Natural Resources, Division of Oil, Gas and Mining. I have prepared a letter that outlines changes to our process and the site configuration over this time period. Please review this letter and attachments and confirm that the original Ground Water Discharge Permit-By-Rule status granted on March 4, 2008 remains valid and in effect.

I will drop an original of this package in the mail to you today. Copies are distributed electronically to those individuals noted on the copy list at the end of the letter.

If you require any further information, please contact me at your convenience.

Best regards,

Earth Energy Resources Inc.

Barclay Cuthbert

Vice President, Operations

Tel: + 1.403.233.9366

Cell: + 1.403.619.4230

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